

**WHAT IS CLAIMED IS:**

1. A method of determining an attachment position of a color misregistration detection sensor for use in an image forming apparatus which overlays colors on the basis  
5 of arbitrary image information to form a color image on an endless-belt-shaped transfer body that is rotatable in a predetermined direction, comprising the steps, which are carried out in a stage of designing the image forming apparatus, of:

10 checking a relationship between the attachment position of the sensor and a formation positional shift of the color image by moving the sensor along an attachment position candidate line that is defined in advance in another direction perpendicular to the rotational direction  
15 of the transfer body;

finding a specific attachment position on the sensor attachment position candidate line, at which color misregistration of the color image at a side edge portion of the transfer body becomes equal to a maximum value of  
20 color misregistration at a portion except the side edge portion; and

fixing the sensor at a position that satisfies the found specific attachment position and opposes a color image formation surface of the transfer body.

25 2. A method according to claim 1, wherein in the step of checking the relationship between the attachment position of the sensor and the formation positional shift

of the color image, when the rotational direction of the transfer body is defined as a sub scanning direction, and said another direction is defined as a main scanning direction, at least a pair of sensors which are temporarily  
5 arranged on the sensor attachment position candidate line and at two side edge portions, respectively, of the transfer body are moved so as to be closed together along the main scanning direction from the two side edge portions, respectively, of the transfer body toward a central portion  
10 in a widthwise direction of the transfer body, thereby checking the relationship between the attachment positions of the sensors and the formation positional shift of the color image in the main scanning direction.

3. A method according to claim 1, wherein in the  
15 step of checking the relationship between the attachment position of the sensor and the formation positional shift of the color image, when the rotational direction of the transfer body is defined as a sub scanning direction, and said another direction is defined as a main scanning  
20 direction, at least a pair of sensors which are temporarily arranged on the sensor attachment position candidate line and at two side edge portions, respectively, of the transfer body are moved so as to be closed together along the main scanning direction from the two side edge portions,  
25 respectively, of the transfer body toward a central portion in a widthwise direction of the transfer body, thereby checking the relationship between the attachment positions

of the sensors and the formation positional shift of the color image in the sub scanning direction.

4. A method according to claim 1, wherein the relationship between the attachment position of the sensor  
5 and the formation positional shift of the color image is checked by using, as a parameter, a small positional shift amount of a scanning optical unit arranged in the image forming apparatus in a direction of an optical axis.

5. A method according to claim 1, wherein the  
10 relationship between the attachment position of the sensor and the formation positional shift of the color image is checked by using, as a parameter, an internal temperature of the image forming apparatus.

6. A method according to claim 1, wherein the  
15 relationship between the attachment position of the sensor and the formation positional shift of the color image is checked by using, as a parameter, a small positional shift amount of an imaging lens arranged in the image forming apparatus.

20 7. A method according to claim 1, wherein the relationship between the attachment position of the sensor and the formation positional shift of the color image is checked by using, as a parameter, an exit angle of a laser beam that exits from a collimator unit arranged in the  
25 image forming apparatus.

8. A method according to claim 2, wherein the pair of sensors are attached to positions asymmetrical with

respect to the central portion in the widthwise direction of the transfer body.

9. A method according to claim 3, wherein the pair of sensors are attached to positions asymmetrical with  
5 respect to the central portion in the widthwise direction of the transfer body.

10. An image forming apparatus which overlays colors on the basis of arbitrary image information to form a color image, comprising:

10 an endless-belt-shaped transfer body which is rotatable in a predetermined direction;

image forming means for overlaying the colors on the basis of the image information to form the color image on said transfer body;

15 color misregistration detection sensor means, arranged to be movable along an attachment position candidate line that is defined in advance in another direction perpendicular to the rotational direction of said transfer body, for detecting color misregistration of the  
20 color image formed on said transfer body by said image forming means; and

control means for controlling said image forming means to correct color overlay on the basis of a detection signal of the color image by said sensor means,

25 wherein said sensor means is fixed at a position that satisfies a specific attachment position at which color misregistration of the color image at a side edge portion

of said transfer body becomes equal to a maximum value of color misregistration at a portion except the side edge portion and opposes a color image formation surface of said transfer body.

5        11. An apparatus according to claim 11, wherein said sensor means comprises at least a pair of registration sensors which are temporarily arranged on the sensor attachment position candidate line and at two side edge portions, respectively, of said transfer body, and, in a  
10 stage of designing the image forming apparatus, said pair of registration sensors are moved so as to be closed together along the sensor attachment position candidate line from the two side edge portions, respectively, of said transfer body toward a central portion in a widthwise  
15 direction of said transfer body by a sensor moving means that is a virtual means used for convenience sake at the time of putting the method of determining the attachment position of the registration sensors into practice.

20        12. An apparatus according to claim 10, wherein said sensor means comprises three registration sensors, two of which are temporarily, and, in a stage of designing the image forming apparatus, said pair of registration sensors are moved so as to be closed together along the sensor attachment position candidate line from the two side edge  
25 portions, respectively, of said transfer body toward a central portion in a widthwise direction of said transfer body by a sensor moving means that is a virtual means used

for convenience sake at the time of putting the method of determining the attachment position of the registration sensors into practice, and remaining one of which is arranged on the sensor attachment position candidate line  
5 and at a position corresponding to the central portion in the widthwise direction of said transfer body.

13. An image forming method of causing an image forming system to overlay colors on the basis of arbitrary image information to form a color image on an  
10 endless-belt-shaped transfer body that is rotatable in a predetermined direction, comprising the steps, which are carried out in a stage of designing the image forming apparatus, of:

checking a relationship between the attachment  
15 position of the sensor and a formation positional shift of the color image by moving the sensor along a sensor attachment position candidate line that is defined in advance in another direction perpendicular to the rotational direction of the transfer body;

20 finding a specific attachment position on the sensor attachment position candidate line, at which color misregistration of the color image at a side edge portion of the transfer body becomes equal to a maximum value of color misregistration at a portion except the side edge  
25 portion;

fixing the sensor at a position that satisfies the found specific attachment position and opposes a color

image formation surface of the transfer body; and

controlling the image forming system to correct color overlay on the basis of a detection signal of the color image by the sensor.

5        14. A method according to claim 13, wherein in the step of checking the relationship between the attachment position of the sensor and the formation positional shift of the color image, when the rotational direction of the transfer body is defined as a sub scanning direction, and  
10 said another direction is defined as a main scanning direction, at least a pair of sensors which are temporarily arranged on the sensor attachment position candidate line and at two side edge portions, respectively, of the transfer body are moved so as to be closed together along  
15 the main scanning direction from the two side edge portions, respectively, of the transfer body toward a central portion in a widthwise direction of the transfer body, thereby checking the relationship between the attachment positions of the sensors and the formation positional shift of the  
20 color image in the main scanning direction.

15        15. A method according to claim 13, wherein in the step of checking the relationship between the attachment position of the sensor and the formation positional shift of the color image, when the rotational direction of the transfer body is defined as a sub scanning direction, and  
25 said another direction is defined as a main scanning direction, at least a pair of sensors which are temporarily

arranged on the sensor attachment position candidate line and at two side edge portions, respectively, of the transfer body are moved so as to be closed together along the main scanning direction from the two side edge portions, respectively, of the transfer body to a central portion in a widthwise direction of the transfer body, thereby checking the relationship between the attachment positions of the sensors and the formation positional shift of the color image in the sub scanning direction.

10        16.     A method according to claim 13, wherein the relationship between the attachment position of the sensor and the formation positional shift of the color image is checked by using, as a parameter, a small positional shift amount of a scanning optical unit arranged in the image forming apparatus in a direction of an optical axis.

15        17.     A method according to claim 13, wherein the relationship between the attachment position of the sensor and the formation positional shift of the color image is checked by using, as a parameter, an internal temperature of the image forming apparatus.

20        18.     A method according to claim 13, wherein the relationship between the attachment position of the sensor and the formation positional shift of the color image is checked by using, as a parameter, a small positional shift amount of an imaging lens arranged in the image forming apparatus.

25        19.     A method according to claim 13, wherein the



relationship between the attachment position of the sensor and the formation positional shift of the color image is checked by using, as a parameter, an exit angle of a laser beam that exits from a collimator unit arranged in the  
5 image forming apparatus.